

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
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ENVIRONMENTAL PROTECTION
AGENCY-REGION VII
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In the Matter of:

Operable Unit 77

Madison County Mines Site

Madison County, Missouri

Anschutz Mining Corporation,

and

NL Industries, Inc.,

Respondents.

Proceedings under Sections

104, 107 and 122 of the

Comprehensive Environmental

Response, Compensation, and

Liability Act of 1980

(42 U.S.C. §§ 9604, 9607 and 9622).)

Docket No.

CERCLA-07-2003-0176

ADMINISTRATIVE ORDER ON CONSENT
FOR REMOVAL SITE INVESTIGATION

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I. INTRODUCTION

1. This Administrative Order on Consent for Removal Site Investigation ("Consent Order" or "Order") is entered into by the United States Environmental Protection Agency ("EPA") and Anschutz Mining Corporation and NL Industries, Inc.

("Respondents"). This Consent Order requires the performance of Removal Site Investigation Activities pursuant to 40 C.F.R. Part 300 of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), at portions of Operable Unit 77 of the Madison County Mines Site ("Site"), which is located in Fredericktown, Madison County, Missouri.

II. JURISDICTION

2. This Consent Order is issued pursuant to the authority vested in the President of the United States by Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, 42 U.S.C. §§ 9604, 9607, and 9622 ("CERCLA"). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order 12580, 52 Fed. Reg. 2926 (1987), and was further delegated to the Regional Administrators on September 13, 1987, by EPA Delegation No. 14-14-C. This authority was subsequently delegated to the

Director, Superfund Division, by EPA Region VII Delegation No. R7-14-14C, dated January 1, 1995.

3. Respondents' participation in this Consent Order shall not constitute or be construed as an admission of liability or of the findings or determinations contained in this Consent Order. Respondents agree to comply with and be bound by the terms of this Consent Order. Respondents consent to and agree not to contest EPA's authority or jurisdiction to issue or to enforce this Consent Order. Respondents further agree not to contest the basis or validity of this Consent Order.

4. EPA has notified the State of Missouri of the issuance of this Consent Order.

III. DEFINITIONS

5. Unless otherwise expressly provided herein, terms used in this Consent Order which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in the statute or its implementing regulations, as amended. Whenever terms listed below are used in this Consent Order or in the documents attached to this Consent Order or incorporated by reference into this Consent Order, the following definitions shall apply:

a. "Consent Order" shall mean this Administrative Order on Consent for Removal Site Investigation Activities and all attachments hereto. In the event of conflict between this Consent Order and any provision of any other agreement, order or writing, the terms and conditions of this Consent Order shall control.

b. "Day" shall mean a calendar day unless expressly stated to be a working day. "Working day" shall mean any day other than a Saturday, Sunday, or Federal holiday. In computing any period of time under this Consent Order, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the end of the next Working day.

c. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300 et seq., as amended.

d. "Paragraph" shall mean a portion of this Consent Order identified by an Arabic numeral, a letter of the alphabet or a lower case Roman numeral.

e. "Parties" shall mean the United States and the Respondents.

f. "Section" shall mean a portion of this Consent Order identified by a Roman numeral and includes one or more paragraphs, unless used to refer to a statutory or regulatory section.

g. "Site" shall mean that portion of Operable Unit 77 of the Madison County Mines Site ("Site"), which is located in Northeastern Madison County in and around the City of Fredericktown, Missouri, comprised of those properties, along the intermittent stream designated as Toller Branch, beginning at the discharge point of the dam structure on the Anschutz property where overtopping and subsequent failure of the dam during a storm event occurred in March 1977, and continuing downstream, within and including the yards and property covering three houses on either side of Toller Branch and continuing through Fredericktown until the confluence with Saline Creek and then along Saline Creek until the confluence with the Little St. Francis River and including any low lying areas along the aforementioned creeks where mine tailings from the dam failure may have come to be deposited by the storm water. The Site is located within the Buckeye Patent and Sections 7 and 8, Township 33 North, Range 7 East in Madison County, Missouri. A map of the Site is included with Attachment 1.

h. "United States" shall mean the United States of America, and any and all agencies and instrumentalities thereof.

i. "Work" shall mean all activities Respondents are required to perform under this Consent Order, including any activities required to be undertaken pursuant to the terms and conditions of this Consent Order and the Work Plan set forth in Attachment 1.

j. "Work Plan" shall mean the document describing the Work to be implemented at the Site, as approved by EPA and set forth in Attachment 1 to this Consent Order, and any and all substitutions, modifications or revisions made to such document in accordance with this Order.

IV. STATEMENT OF PURPOSE

6. This Consent Order requires Respondents to perform a Removal Site Investigation Study consistent with the NCP, 40 C.F.R. Part 300. The purpose of the Removal Site Investigation is to determine the nature and extent of contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants or contaminants at or from the Site. The scope and substance of the Removal Site Investigation to be performed by Respondents is set forth in Section VIII (Work to be Performed)

of this Consent Order and in the Work Plan, incorporated herein as Attachment 1 to this Consent Order.

V. EPA'S FINDINGS OF FACT

7. The Site is located in Northeastern Madison County in and around the City of Fredericktown, Missouri, comprised of those properties, along the intermittent stream designated as Toller Branch, beginning at the discharge point of the dam structure on property currently owned by Anschutz Mining Corporation (AMC) where overtopping and subsequent failure of the dam during a storm event occurred in March 1977, and continuing downstream, within and including the yards and property covering three houses on either side of Toller Branch and continuing through Fredericktown until the confluence with Saline Creek and then along Saline Creek until the confluence with the Little St. Francis River and including any low lying areas along the aforementioned creeks where mine tailings from the dam failure may have come to be deposited by the storm water. The Site is located within the Buckeye Patent and Sections 7 and 8, Township 33 North, Range 7 East in Madison County, Missouri. A map of the Site is included with Attachment 1.

8. On March 28, 1977, after a heavy rain, a dam impounding a 40 acre mine tailings pond on property in Madison County

currently owned by AMC collapsed allowing water and mine tailings to flow into Toller Branch, an intermittent stream. The mixture of water and mine tailings continued down Toller Branch, flowed into Saline Creek and ultimately entered the Little St. Francis River. Many of the areas along Toller Branch and Saline Creek effected by the collapse of the tailings dam are located in residential areas of Fredericktown, Missouri.

9. Respondent Anschutz Mining Corporation (AMC), a Colorado Corporation registered to do business in the State of Missouri, currently owns property in Madison County which contains large quantities of mill waste materials including the large dam and tailings impoundment which failed in March 1977. Respondent AMC has voluntarily conducted site characterization and stabilization activities on their property over the past several years.

10. Respondent NL Industries, Inc. (NL) conducted mining operations in Madison County, Missouri and disposed of mine wastes containing lead, zinc, and cadmium in and around the areas of their mining operation including the dam and tailings impoundment which failed in March 1977. Respondent NL is a New Jersey Corporation registered to do business in the State of Missouri.

11. Mining processes resulted in the production of mill waste materials called chat and flotation tailings.

12. Chat is fine to coarse dolomite rock fragments produced during the milling process in which density separation was used to separate the ore. Chat was transported mechanically by conveyor and disposed of in piles on the AMC property.

13. Flotation tailings were produced by the flotation milling process. Tailings typically are smaller fragment fines, silts, silty sands, and clay. The flotation tailings were disposed of by hydraulically depositing them into impoundments known as tailings ponds.

14. Sampling and analysis conducted by BE&K Terranext revealed the mine tailings pile, located on property owned by AMC and formerly operated by NL where the dam failure occurred, has elevated levels of arsenic as high as 145 mg/kg; levels of manganese as high as 45,000 mg/kg; levels of lead as high as 7,200 mg/kg; and levels of cobalt as high as 800 mg/kg.

15. Additional sampling and analysis at the Site is necessary to determine the extent to which contaminants may have impacted the areas along Toller Branch and Saline Creek including residential yards.

VI. EPA'S CONCLUSIONS OF LAW AND DETERMINATIONS

16. The Site is a "facility" as defined at Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

17. Arsenic, cobalt, lead and manganese are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

18. The conditions at the Site constitute an actual or threatened release of hazardous substances into the environment, as defined in Sections 101(8) and (22) of CERCLA, 42 U.S.C. §§ 9601(8) and (22).

19. Each Respondent is a "person" as defined in Sections 101(21) and 107(a)(3) of CERCLA, 42 U.S.C. §§ 9601(21) and 9607(a)(3).

20. Respondent NL Industries, Inc. is a responsible party under Sections 104, 107, and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607, and 9622 as a former operator at the Site.

21. Respondent Anschutz Mining Corporation is a responsible party under Sections 104, 107, and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607, and 9622, as a current owner of a portion of the Site.

22. EPA is authorized to act pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, to investigate the existence and extent

of the release or threat of release at the Site, the source and nature of the hazardous substances, pollutants or contaminants involved, and the extent of danger to the public health and welfare and the environment.

23. The work ordered and agreed to by Respondents under the terms of this Consent Order is in the public interest and if carried out in conformance with the requirements of this Order will be consistent with the National Contingency Plan, 40 C.F.R. Part 300, et seq.

VII. PARTIES BOUND

24. The terms of this Consent Order shall apply to and be binding upon the Respondents, their successors and assigns. The signatories to this Consent Order certify that they are authorized to execute and legally bind the parties they represent to this Consent Order.

25. No change in the ownership, corporate or partnership status of the Respondents or of the Site shall alter the responsibilities of the Respondents under this Consent Order. Respondents shall provide a copy of this Consent Order to any successors in interest before ownership rights, partnership shares, or stock or assets in a corporate acquisition or merger

are transferred. Respondents shall provide a copy of this Consent Order to each of their contractors, principal subcontractors, laboratories, consultants, and representatives retained or employed to conduct any Work performed under this Consent Order prior to their initiation of work. Respondents shall be responsible for any noncompliance with this Order. Respondents shall be responsible for ensuring that their contractors, subcontractors, laboratories, consultants, and employees comply with all provisions of this Consent Order.

VIII. WORK TO BE PERFORMED

26. Based on the foregoing Findings of Fact, and Conclusions of Law and Determinations it is hereby ordered and agreed that Respondents shall perform the following actions:

27. Respondents shall conduct a removal site investigation in accordance with this Order and the EPA-approved Work Plan which is Attachment 1. The goals of the Work Plan are (i) to determine the nature and extent of contamination at the Site; and (ii) assess human health and ecological risks posed by the contaminants.

A. Designation of Contractor and Project Coordinator

28. Respondents have retained BE&K/Terranext to perform the Work required by this Order and Work Plan, and Respondents are

authorized to proceed with the Work in accordance with the attached approved Work Plan. Respondents shall notify EPA of the name and qualifications of any other contractors or subcontractors retained to perform Work under this Consent Order at least ten (10) days prior to commencement of such Work.

29. Respondents have designated Steven Lange of BE&K/Terranext as their Project Coordinator, and Respondents are authorized to proceed with the Work in accordance with the attached approved Work Plan. Respondents' Project Coordinator shall be responsible for administration of all the actions required of Respondents by the Consent Order. Respondents' Project Coordinator shall be present at the Site or readily available by telephone during Site Work.

30. EPA retains the right to disapprove of any, or all, of the contractors or subcontractors selected by Respondents, including the Project Coordinator, pursuant to Section X (Submissions Requiring EPA Approval). If EPA disapproves of a selected contractor, subcontractor, or Project Coordinator, Respondents shall invoke dispute resolution or retain a different person, and shall notify EPA of that person's name, address, telephone number, and qualifications within fifteen (15) days following EPA's disapproval. Receipt by Respondents' Project

Coordinator of any notice or communication from EPA relating to this Consent Order shall constitute receipt of the same by Respondents.

31. EPA has designated J. Heath Smith as its Project Coordinator. Respondents shall direct three bound, one unbound, and an electronic copy of all submissions required by this Consent Order to Mr. Smith at the United States Environmental Protection Agency, Region VII, Superfund Division, 901 North 5th Street, Kansas City, Kansas 66101, (913) 551-7903. Respondents shall also direct a bound copy of all submissions required by this Consent Order to Mr. Robert Hinkson, Hazardous Waste Program, Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, Missouri 65102-0176.

32. EPA and Respondents shall have the right to change their designated Project Coordinators and contractors. Verbal notice of such change shall be provided to the other parties within twenty-four (24) hours of such change and written notice shall follow within five (5) days of such change. Such change by Respondents is subject to EPA approval as set forth above.

B. Work Plan Implementation

33. Respondents shall implement the Work Plan as finally approved by EPA in accordance with the schedule approved by EPA.

34. Respondents shall notify EPA at least fourteen (14) days prior to performing any on-site Work pursuant to the Work Plan approved by EPA.

35. All sampling and analysis activities undertaken as part of this Consent Order shall be conducted in accordance with the EPA approved Quality Assurance Project Plan ("QAPP"). All sampling and analyses performed pursuant to this Consent Order shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures in accordance with the appropriate EPA guidance(s) described in the attached Work Plan.

36. Respondents shall use only laboratories which have a documented Quality Assurance Program referred in the Work Plan. Upon request by EPA, Respondents shall make available to EPA QA/QC documentation used by the laboratory and shall also make available to EPA results of any audit samples analyzed by the laboratory and documentation demonstrating laboratory proficiency such as participation in laboratory certification programs.

37. Upon request by EPA, Respondents shall, at their expense, have the laboratory used by Respondent analyze samples submitted by EPA for quality assurance monitoring.

38. Upon request by EPA, Respondents shall allow EPA or its authorized representatives to take split or duplicate samples of any samples collected by Respondents while performing Work pursuant to this Consent Order. Respondents shall notify EPA not less than fourteen (14) days in advance of any sample collection activity. EPA shall have the right to take any additional samples that it deems necessary. EPA will notify Respondents not less than fourteen (14) days in advance of any additional sample collection activity, unless EPA deems the additional sampling necessary in response to an emergency as defined in Section XIV, CERCLA and regulations promulgated under CERCLA. EPA will allow Respondents to take split or duplicate samples of any additional samples collected by EPA.

C. Monthly Progress Reports

39. Respondents shall submit a written progress report to EPA concerning activities undertaken pursuant to this Consent Order beginning the first full month following the effective date of this Order, and continuing until Respondents have submitted their Removal Site Investigation Report. The reports shall be

due by the tenth (10th) day of the following month. These reports shall describe all significant developments during the preceding period; the actual Work performed, any problems encountered in completing this Work; the developments anticipated and the Work scheduled during the next reporting period, including a schedule of completion for the unfinished Work from the preceding period and Work to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

D. Removal Site Investigation Report

40. Within thirty (30) days after Respondents have received all analytical data generated as a result of the Work Plan required by this Consent Order, Respondents shall submit a Removal Site Investigation Report for EPA review and approval. This report shall be subject to the review and approval procedures of Section X (Submissions Requiring Agency Approval) of this Consent Order.

41. The Removal Site Investigation Report shall provide a description of the field activities conducted, maps or drawings showing the location of all sampling points, and a summary of the analytical results, as required by the attached Work Plan.

IX. ACCESS TO PROPERTY AND INFORMATION

42. Respondents shall use best efforts to obtain access to properties at the Site as is necessary to conduct the activities required by this Consent Order and shall provide such access to EPA. Respondents shall also provide to EPA all records and documentation in Respondents' possession or in the possession of their contractors, subcontractors, laboratories, consultants, and employees, related to the conditions at the Site and the activities conducted pursuant to this Consent Order. Such access to property and information shall be provided to EPA employees, contractors, agents, consultants, designees, representatives, and State of Missouri representatives. These individuals shall be permitted to move freely at the Site and appropriate off-site areas in order to conduct actions which EPA determines to be necessary. Access shall continue until such time as EPA notifies Respondents that all CERCLA response action has been completed at the Site.

43. Respondents shall use best efforts to obtain all necessary access agreements as soon as practicable after the effective date of this Consent Order, or as otherwise specified in writing by EPA's Project Coordinator. Such agreements shall provide access for EPA, its contractors and oversight officials,

and the Respondent and/or its authorized representatives.

Respondents shall immediately notify EPA if, after using its best efforts, it is unable to obtain such agreements. As used in this Section, "best efforts" shall include an initial visit, a follow-up telephone call and a certified letter from Respondents to the present owner of the property, requesting an access agreement to permit Respondents and EPA, including its authorized representatives, access to the property to conduct the activities required under this Consent Order. In Respondents' notification to EPA of failure to obtain access, Respondents shall describe and document in writing its efforts to obtain access. EPA may then assist Respondents in gaining access, to the extent necessary to effectuate the response activities described herein, using such means as EPA deems appropriate, including exercising its authority pursuant to Section 104(e) of CERCLA, 42 U.S.C. § 9604(e).

44. Notwithstanding any provision of this Consent Order, EPA retains all of its access authorities and rights, including enforcement authorities related thereto, under CERCLA and any other applicable statutes or regulations.

X. SUBMISSIONS REQUIRING EPA APPROVAL

45. After review of any plan, report or other item which is required to be submitted for approval pursuant to this Consent Order, EPA shall: (a) approve, in whole or in part, the submission; (b) approve the submission with modifications; (c) disapprove, in whole or in part, the submission, directing Respondents to resubmit the document after incorporating EPA's comments; (d) disapprove the submission and assume responsibility for performing all or any part of the response activities; or (e) any combination of the above.

46. In the event of approval or approval with modifications by EPA, pursuant to Paragraph 45, Respondents shall proceed to take any action required by the plan, report, or other item, as approved or modified by EPA or invoke dispute resolution for the portions modified.

47. Upon receipt of a notice of disapproval pursuant to Paragraph 45, Respondents shall, within fourteen (14) calendar days or such other time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other item for approval.

48. Notwithstanding the receipt of a notice of disapproval pursuant to Paragraph 45, Respondents shall proceed, at the

direction of EPA, to take any action required by any non-deficient portion of the submission. Implementation of any non-deficient portion of a submission shall not relieve Respondents of any liability for stipulated penalties under Section XX (Stipulated Penalties).

49. In the event that a plan, report or other item, or portion thereof, which is resubmitted to EPA is disapproved or modified by EPA, Respondents shall be deemed to have failed to submit such plan, report, or other item in a timely and adequate manner, unless Respondents invoke the procedures of Section XVIII (Dispute Resolution), and EPA's action is overturned pursuant to the Section.

50. The provisions of Section XVIII (Dispute Resolution) and Section XX (Stipulated Penalties) shall govern the implementation of the Work, and accrual and payment of any stipulated penalties during dispute resolution. If EPA's disapproval is upheld, stipulated penalties shall accrue for such violation from the date on which the initial submission was required, as provided in Section XX (Stipulated Penalties).

51. All plans, reports and other items required to be submitted to EPA under this Consent Order shall, upon approval by EPA, be enforceable under this Consent Order. In the event EPA

approves a portion of a plan, report or other item required to be submitted to EPA under this Consent Order, the approved portion shall be enforceable under this Consent Order.

**XI. RECORD RETENTION, DOCUMENTATION,
AND AVAILABILITY OF INFORMATION**

52. Respondents shall preserve all documents and information relating to Work performed under this Consent Order, or relating to the hazardous substances found on or released from the Site, for ten (10) years following completion of the Work required by this Consent Order. If, during such ten year period, EPA shall request, in writing, a review of, or copies of, any such documentation or information, Respondents shall provide the copies of such documents or information to EPA within fifteen (15) working days. At the end of this ten year period and thirty (30) days before any document or information is destroyed, Respondents shall notify EPA that such documents and information are available to EPA for inspection, and upon request, shall provide the original or true and accurate copies of such documents and information to EPA.

53. Nothing herein shall be interpreted as limiting or affecting the Respondents' rights to preserve the confidentiality of attorney work product or attorney-client communications.

However, no documents, reports or other information created or generated pursuant to the requirements of this Consent Order shall be withheld on the grounds that they are privileged. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical or engineering data evidencing conditions at or around the Site.

54. Respondents may assert a business confidentiality claim pursuant to 40 C.F.R. § 2.203(b) with respect to part or all of any information they submit to EPA pursuant to this Consent Order, provided such claim is allowed by Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7). Analytical and other data specified in Section 104(e)(7)(F) of CERCLA shall not be claimed as confidential by the Respondents. EPA shall disclose information covered by a business confidentiality claim only to the extent permitted by, and by means of the procedures set forth in, 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when it is received by EPA, EPA may make it available to the public without further notice to Respondents. EPA may, at any time, challenge claims of privilege through negotiations or otherwise as provided by law or the Federal Rules of Civil Procedure.

XII. OFF-SITE SHIPMENTS

55. Any hazardous substances, pollutants or contaminants removed off-site by Respondents pursuant to this Consent Order for treatment, storage or disposal shall be treated, stored, or disposed of at a facility in compliance, as determined by EPA, with the EPA Off-Site Rule, 40 C.F.R. § 300.440, promulgated pursuant to 42 U.S.C. § 9621(d)(3).

XIII. COMPLIANCE WITH OTHER LAWS

56. All actions required pursuant to this Consent Order shall be performed in accordance with all applicable local, state, and federal laws and regulations except as provided in CERCLA Section 121(e), 42 U.S.C. § 9621(e), and 40 C.F.R. § 300.415(j). In accordance with 40 C.F.R. Part 300, all Work required pursuant to this Consent Order shall, to the extent practicable, as determined by EPA, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental, state environmental, or facility siting laws. All ARARs shall be identified in the Work Plan.

XIV. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

57. If any incident, or change in Site conditions, relating to the activities conducted pursuant to this Consent Order causes

or threatens to cause an additional release of hazardous substances from the Site or an endangerment to the public health, welfare, or the environment, Respondents shall immediately take all appropriate action, in accordance with all applicable provisions of this Order, to abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify EPA's Project Coordinator, or, in the event of his unavailability, shall notify the Regional Duty Officer, Superfund Division, EPA Region VII, (913) 281-0991, of the incident or Site conditions. Respondents shall submit a written report to EPA within seven (7) days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the recurrence of such a release.

58. In addition, in the event of any release of a hazardous substance above a reportable quantity from the Site, during and related to the activities conducted pursuant to this Consent Order, Respondents shall immediately notify the National Response Center at (800) 424-8802 and EPA's Project Coordinator at (913) 551-7903.

59. These requirements are in addition to the requirements set forth in the Emergency Planning and Community Right-to-know Act ("EPCRA"), 42 U.S.C. § 11001 et seq.

XV. AUTHORITY OF EPA'S PROJECT COORDINATOR

60. EPA's Project Coordinator shall be responsible for overseeing the implementation of this Consent Order. EPA's Project Coordinator shall have the authority vested in a Remedial Project Manager ("RPM") and an On-Scene Coordinator ("OSC") by the NCP, including the authority to halt, conduct, or direct any Work required by this Consent Order, or to direct any other response action undertaken by EPA or Respondents at the Site. Absence of EPA's Project Coordinator from the Site shall not be cause for stoppage of Work unless specifically directed by EPA's Project Coordinator.

XVI. ADDITIONAL WORK

61. EPA may determine that sampling, analysis, or reporting, or other tasks in addition to those specifically set forth in the attached Work Plan or this Consent Order are necessary to satisfy the purposes of this Consent Order. If EPA so determines, it will advise Respondents in writing of the nature of the additional tasks and the basis for EPA's

determination that the additional work is necessary. Respondents may request a meeting with EPA to discuss the additional work within seven (7) days of its receipt of EPA's written determination. Within ten (10) days of receipt of EPA's written determination, Respondents shall advise EPA in writing of either its agreement to perform the additional tasks requested, or its refusal to undertake the additional tasks and the reasons for such refusal.

62. If Respondents refuse to undertake the additional work, Respondents shall initiate the dispute resolution process set forth in Section XVIII of this Order. The time period for initiation of dispute resolution, as set forth in Paragraph 71 hereof, shall run from the date Respondents receive written notice from EPA of its determination that additional work is necessary to satisfy the purpose of this Order. Delay in performing such additional work resulting from Respondents' exercise of their right to dispute any EPA notice of additional work issued pursuant to this Section shall not be subject to stipulated penalties pursuant to Section XX (Stipulated Penalties).

63. If Respondents agree to perform the additional tasks requested or if the Dispute Resolution decision is that

additional work is required, Respondents shall, within the time specified in the determination from EPA or the Dispute Resolution decision, submit a Supplemental Work Plan which shall be subject to EPA's approval as set forth in Section X (Submissions Requiring EPA Approval). Upon approval of the Supplemental Work Plan by EPA, Respondents shall implement the Supplemental Work Plan. The Supplemental Work Plan shall address the effect of the additional Work on each part of the approved initial Work Plan.

64. All additional Work performed by Respondents under this Section shall be performed in a manner consistent with this Consent Order.

XVII. REIMBURSEMENT OF COSTS

65. Respondents shall reimburse the United States, upon written demand, for all Oversight Costs incurred by the United States from the effective date of this Consent Order until issuance of the Notice of Completion pursuant to Section XXVI in relation to the presence of contaminants, contamination, hazardous substances, or wastes located at this Site. Respondents shall pay all Oversight Costs incurred by the United States in relation to the Work to be performed pursuant to this Consent Order to the extent that such Work is not inconsistent with the NCP.

66. EPA shall periodically submit to Respondents a bill for Oversight Costs and a reconciled Regional Itemized Cost Summary which shall serve as the basis for the payment demand.

67. Payment by Respondents of Oversight Costs is due within sixty (60) days of the receipt of the bill. If payment is not made within sixty (60) days of Respondents' receipt of the bill, interest on any unpaid amounts shall accrue at the rate established pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a). The interest shall begin to accrue on the date of the Respondents' receipt of the bill. Interest shall accrue at the rate specified through the date of Respondents' payment.

Payments of interest made under this Paragraph shall be in addition to remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section.

68. Payments to the United States for EPA's Oversight Costs shall be made by certified or cashier's check or wire transfer payable to EPA Hazardous Substance Superfund and must be designated as "Response Costs" and include the name of the Site ("Operable Unit 77, Madison County Mines Site"), the Site identification number ("07LT OUTB"), the account number that will

be provided to Respondents by EPA, and the Docket Number of this Consent Order. Checks shall be forwarded to:

Mellon Bank
Attn: Superfund Accounting
EPA Region VII, Comptroller Branch
P.O. Box 360748M
Pittsburgh, Pennsylvania 15251

Wire transfers shall be directed to:

Account 910-9070
ABA# 043000261/Mellon Bank West
EPA Region VII Superfund Accounting
Pittsburgh, Pa.

Copies of the transmittal letter and check or evidence of wire transfer should be sent simultaneously to the EPA Project Coordinator.

69. Respondents may dispute, in accordance with Section XVIII (Dispute Resolution), all or part of a bill for Oversight Costs. Any such dispute shall be limited to accounting errors or inconsistencies with the NCP.

70. If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondents, on or before the due date, shall pay (a) the full amount of the uncontested costs into the Hazardous Substances Superfund account and (b) the full amount of all contested costs into an interest

bearing escrow bank account established by Respondents.

Respondents shall simultaneously transmit a copy of each check to EPA's Project Coordinator. Respondents shall ensure that the prevailing party or parties in the dispute shall receive the amount upon which they prevailed from the escrowed funds, with interest, within ten (10) days after the dispute is resolved.

XVIII. DISPUTE RESOLUTION

71. If Respondents disagree, in whole or in part, with any EPA disapproval or other decision or directive made by EPA pursuant to this Consent Order, they shall notify EPA in writing of its objections and the basis for such objections, within ten (10) working days of receipt of EPA's disapproval, decision, or directive. Such notice shall set forth the specific points of the dispute, the position Respondents maintain should be adopted as consistent with the requirements of this Consent Order, the factual and legal basis for Respondents' position, and all matters Respondents consider necessary for EPA's determination. EPA and Respondents shall then have ten (10) working days from EPA's receipt of Respondents' objections to attempt to informally resolve the dispute. If agreement is reached, the resolution shall be reduced to writing, signed by the parties, and incorporated into this Consent Order. If the parties are unable

to reach agreement within this ten (10) working-day period, the matter shall be referred to the Superfund Division Director. The Superfund Division Director shall then decide the matter and provide a written statement of his/her decision to the parties, which shall be incorporated into this Consent Order.

72. The invocation of the dispute resolution process under this Section, or a claim of force majeure, shall not stay the accrual of stipulated penalties, or extend or postpone any deadline or obligations of Respondents, including the obligation to pay stipulated penalties, under this Consent Order with respect to the disputed issue, unless EPA otherwise agrees in writing. Stipulated penalties shall accrue from the first day of non-compliance by Respondent, and shall continue to accrue during dispute resolution procedures until twenty-one (21) days after Respondent requests a determination by the Superfund Division Director pursuant to Paragraph 71 herein, after which date stipulated penalties shall stop accruing until issuance by the Superfund Division Director of a decision resolving the dispute. Any stipulated penalties shall continue to accrue during the dispute resolution process for all matters unrelated to the contested matters at issue in the dispute resolution process.

73. Notwithstanding any other provision of this Consent Order, no action or decision by EPA, including without limitation, decisions of the Superfund Division Director pursuant to this Consent Order, shall constitute final EPA action giving rise to any rights to judicial review prior to EPA's initiation of judicial action to compel Respondents' compliance with the requirements of this Consent Order.

XIX. FORCE MAJEURE

74. Respondents agree to perform all requirements of this Consent Order within the time limits established by this Consent Order, unless the performance is prevented or delayed by events which constitute a force majeure. For purposes of this Consent Order, a force majeure is defined as any event arising from causes not foreseeable and beyond control of Respondents or their consultants, contractors, subcontractors or agents, that delays or prevents performance in accordance with the schedule required by this Consent Order, despite Respondents' best efforts to meet the schedule. Force majeure does not include financial inability to complete the Work, unanticipated or increased costs of performance, normal precipitation events, changed economic circumstances or failure to obtain federal, state or local permits.

75. Respondents shall immediately notify EPA orally, and shall also notify EPA in writing within five (5) days after they become aware of events that constitute a force majeure. Such notice shall: Identify the event causing the delay or anticipated delay; provide an estimate of the anticipated length of delay, including necessary demobilization and remobilization; state a description of the cause of the delay; state the measures taken or to be taken to minimize delay; and state the estimated timetable for implementation of these measures. Such notice shall be reviewed by EPA and EPA will determine whether delay has been or will be caused by a force majeure.

76. Respondents shall exercise best efforts to avoid and minimize any delay caused by a force majeure, as defined herein. Failure to comply with the notice provision of this Section shall constitute a waiver of Respondents' right to assert force majeure.

77. If EPA determines that a delay in performance of a requirement under this Consent Order has been or will be caused by a force majeure, EPA may extend the time period for performance of that affected portion of Work. Such an extension does not alter the schedule for performance or completion of other tasks required by the attached Work Plan unless these are

also specifically altered by approval of EPA. In the event EPA and Respondents cannot agree that any delay or failure has been or will be caused by a force majeure, or if there is no agreement on the length of the extension, such dispute shall be resolved in accordance with the provisions of Section XVIII (Dispute Resolution).

XX. STIPULATED PENALTIES

78. Unless there has been a written modification of a compliance date by EPA or an excusable delay as determined by EPA under Section XIX (Force Majeure), in the event Respondents fail to meet any requirement of this Order, stipulated penalties as set forth below shall be assessed against Respondents.

Compliance by Respondents with this Consent Order shall include completion of an activity under this Consent Order or a plan approved under this Consent Order in a manner acceptable to EPA, and within the specified time schedules in and approved under this Consent Order.

79. The stipulated penalties for violations relating to this Consent Order shall accrue as follows:

a. For failure to submit monthly progress reports as required in Section VIII (Work to be Performed) above, in a

timely and adequate manner as required by this Consent Order and the Work Plan, stipulated penalties shall accrue at the rate of \$500 per day for the first through seventh days of noncompliance; \$1,000 per day for the eighth through the thirtieth days of noncompliance and; \$1,500 per day for the thirty-first day and each succeeding day of noncompliance thereafter.

b. For failure to submit the Removal Site Investigation Report, as required in Section VIII (Work to be Performed) above, in a timely and adequate manner as required by this Consent Order and the Work Plan, \$1,000 per day for the first through seventh days of noncompliance; \$2,000 per day for the eighth through the thirtieth days of noncompliance and; \$3,000 per day for the thirty-first day and each succeeding day of noncompliance thereafter.

c. For any other violation of this Consent Order, or for failure to properly perform Work required by this Consent Order or for failure to perform Work within the time frames contained in and approved under this Consent Order, other than submissions of plans, reports, or other documents which Respondents are required to submit to EPA pursuant to this Consent Order, stipulated penalties shall accrue at the rate of \$500 per day for the first through seventh days of noncompliance;

\$1,000 per day for the eighth through the thirtieth days of noncompliance and; \$1,500 per day for the thirty-first day and each succeeding day of noncompliance thereafter.

80. Except as provided in Paragraph 72, all penalties shall begin to accrue on the date that complete performance is due or a violation or non-compliance occurs and shall continue to accrue through the final day of correction of the noncompliance. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Order. Notwithstanding any other provision of this Order, the EPA may, in its discretion, waive any portion of stipulated penalties that have accrued pursuant to this Order.

81. All penalties owing under this Section shall be due within thirty (30) days of receipt by Respondents of written demand by EPA for payment thereof. Interest shall begin to accrue on the unpaid balance at the end of this thirty (30) day period. Interest will accrue on the unpaid balance until such penalties and interest have been paid in full and will be compounded annually.

82. All penalties shall be paid by certified or cashier's check made payable to the "EPA Hazardous Substance Superfund", and shall be remitted to:

Mellon Bank
Attn: Superfund Accounting
EPA Region VII
(Comptroller Branch)
P.O. Box 360748M
Pittsburgh, PA 15251

All payments shall reference the EPA Docket Number which appears on the face of this Consent Order and the Site name ("Operable Unit 77, Madison County Mines Site") and identification number ("07LT OUTB"), and shall indicate that they are in payment of stipulated penalties. A copy of the transmittal of payment shall be sent to EPA's Project Coordinator.

83. The stipulated penalties set forth in this Section do not preclude EPA from pursuing any other remedies or sanctions which may be available to EPA by reason of Respondents' failure to comply with any of the requirements of this Consent Order, nor shall payment of said penalties relieve Respondents of the responsibility to comply with this Consent Order.

XXI. RESERVATION OF RIGHTS

84. Except as expressly provided in this Order, each party reserves all rights and defenses it may have. Nothing herein

shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Order, including the right to seek injunctive relief and/or the imposition of statutory penalties and/or punitive damages. EPA also further reserves the right to take any legal or equitable action as it deems appropriate and necessary, or to require Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law. EPA reserves the right to bring an action against Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States in relation to the Site and not reimbursed by Respondents, and for any other costs incurred by the United States in relation to the Site.

XXII. OTHER CLAIMS

85. By issuance of this Consent Order, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents.

Neither the United States nor EPA shall be a party or be held out as a party to any contract entered into by Respondents or their agents, successors, representatives, contractors, or assigns in carrying out activities pursuant to this Consent Order. Neither Respondents nor their agents, successors, representatives, contractors, or assigns shall be considered agents of the United States.

86. Nothing in this Consent Order constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Consent Order, for any liability such person may have under CERCLA, RCRA or other statutes, or the common law, including, but not limited to, any claims of the United States for costs, damages and interest under Sections 104 and 107(a) of CERCLA, 42 U.S.C. §§ 9604 and 9607(a).

87. This Consent Order does not constitute a preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). Respondents agree not to sue the United States for, and waive any claim to, payment under Sections 106(b), 111, and 112 of CERCLA, 42 U.S.C. §§ 9606(b), 9611, and 9612, against the United States or the Hazardous Substances

Superfund arising out of any activity performed under this Consent Order.

88. No action or decision by EPA pursuant to this Consent Order shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIII. CONTRIBUTION

89. With regard to claims for contribution against Respondents for matters addressed in this Consent Order, the parties hereto agree that Respondents are entitled to protection from such contribution actions or claims to the extent provided by Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2).

90. Nothing in this Consent Order precludes the United States or Respondents from asserting any claims, causes of action or demands against any persons who are not parties to this Consent Order for indemnification, contribution, or cost recovery.

91. Respondents agree that with respect to any suit or claim for contribution brought against it for matters covered by this Consent Order, it will notify EPA of the institution of the suit or claim within thirty (30) days of service of any such suit or claim.

XXIV. INDEMNIFICATION

92. Respondents agree to indemnify, save and hold harmless the United States, its officials, agents, contractors, and employees from any and all claims or causes of action arising from, or on account of, acts or omissions of Respondents, their officers, employees, contractors, subcontractors, receivers, trustees, agents, successors or assigns, in carrying out activities pursuant to this Consent Order, including, but not limited to, claims arising from construction delays.

93. Respondents agree to pay the United States all costs the United States incurs, including, but not limited to, attorney's fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on acts or omissions of Respondents, or any of their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Order.

XXV. MODIFICATIONS

94. This Consent Order may be modified by mutual agreement of Respondents and EPA. Any such amendment shall be in writing and shall be signed by authorized representatives of Respondents

and EPA. Unless otherwise provided for in the amendment, the effective date of any such modification shall be the date on which the written agreement or modification is signed by EPA after signatures of the Respondents. All modifications shall be incorporated into and become a part of this Consent Order.

95. The Work Plan may be modified by mutual agreement of EPA and Respondents' Project Coordinators. Any such modification shall be in writing, signed by the Project Coordinator for EPA and Respondents, and effective on the date signed by EPA.

96. No informal advice, guidance, suggestion or comment by EPA regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain such formal approval as may be required by this Consent Order, and to comply with all requirements of this Consent Order unless or until this Consent Order may be formally modified.

XXVI. NOTICE OF COMPLETION

97. When EPA determines, after EPA's review of the Final Removal Site Investigation Report, that all Work has been fully performed in accordance with this Consent Order, except for certain continuing obligations required by this Consent Order (e.g., record retention, etc.), and that all goals and objectives

of this Consent Order and the Work Plan have been satisfied, including any payments, EPA will provide Notice of Completion to Respondents.

XXVII. SEVERABILITY

98. If any judicial or administrative authority issues an order that invalidates any provision of this Consent Order, or finds that Respondents have sufficient cause not to comply with one or more provisions of this Consent Order, then Respondents shall remain bound to comply with all other provisions of this Consent Order.

XXVIII. SIGNATURE BY PARTIES

99. This Consent Order may be executed in any number of counterparts, each of which when executed and delivered to EPA shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

XXIX. EFFECTIVE DATE

100. This Consent Order shall become effective on the date the Consent Order is filed and file-stamped by the Regional Hearing Clerk after signature by the parties. A file-stamped copy of the Consent Order will be mailed to each party.

IT IS SO ORDERED.

BY: Andrea Jirka DATE: 6/9/03
Andrea Jirka
Acting Director
Superfund Division, Region VII
United States Environmental Protection Agency

In the Matter of Operable Unit 77, Madison County Mines Site,
Madison County, Missouri
Proceeding under Sections 104, 107, and 122 of the Comprehensive
Environmental Response, Compensation, and Liability Act of 1980
(CERCLA), 42 U.S.C. §§ 9604, 9607 and 9622.

The representative of the Respondent who has signed the signature page certifies that he/she is fully authorized to enter into the terms and conditions of this Consent Order and to bind the party he/she represents to this document.

For ANSCHUTZ MINING CORPORATION:

BY: William J. Miller

DATE: May 6, 2003

Name: William J. Miller
Title: Vice President

In the Matter of Operable Unit 77, Madison County Mines Site,
Madison County, Missouri
Proceeding under Sections 104, 107, and 122 of the Comprehensive
Environmental Response, Compensation, and Liability Act of 1980
(CERCLA), 42 U.S.C. §§ 9604, 9607 and 9622.

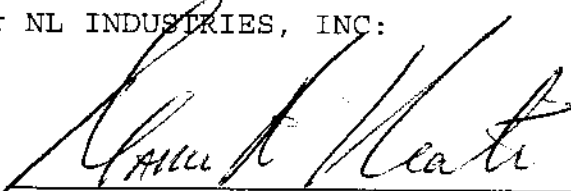
The representative of the Respondent who has signed the signature page certifies that he/she is fully authorized to enter into the terms and conditions of this Consent Order and to bind the party he/she represents to this document.

For ANSCHUTZ MINING CORPORATION:

BY: _____
Name:
Title:

DATE: _____

For NL INDUSTRIES, INC:

BY: 
Name: *marcus a. martin*
Title: *Counsel*

DATE: May 23, 2003

CHARACTERIZATION STUDY
WORK PLAN
ANALYSIS OF SOILS FOR LEAD
TOLLAR BRANCH
FREDERICKTOWN, MISSOURI

PREPARED FOR
ANSCHUTZ MINING CORPORATION

&

NL INDUSTRIES, INC.
HOUSTON, TEXAS

PREPARED BY
BE&K/TERRANEXT
LENEXA, KANSAS

March 25, 2003

RECEIVED
MAR 28 2003
SUPERFUND DIVISION

BE&K/Terranext

CHARACTERIZATION STUDY
WORK PLAN
ANALYSIS OF SOILS FOR LEAD
TOLLAR BRANCH
FREDERICKTOWN, MISSOURI


PREPARED FOR
ANSCHUTZ MINING CORPORATION
&
NL INDUSTRIES, INC.
HOUSTON, TEXAS

PREPARED BY



Steven L. Lange
BE&K/TERRANEXT

REVIEWED BY



James Graham, RG
BE&K/TERRANEXT

March 25, 2003

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1.0 PROJECT MANAGEMENT

1.1 DISTRIBUTION LIST

Clients	Rick Jones, Anschutz Mining Corporation Terry Casey, Agent for NL Industries Inc.
BE&K Terranext	Steven L. Lange, Project Manager James Graham, RG, Quality Assurance Manager
Region 7 EPA	Heath Smith, Project Manager John Cook, PE, Remedial Project Manager
MDNR	Robert C. Hinkson

1.2 PROJECT, TASK ORGANIZATION, AND SCOPE OF WORK

BE&K/Terranext (Terranext) prepared this Characterization Study Work Plan for the investigation of lead in soils potentially affected by the 1977 tailings release from the D-tailings area into Tollar Branch, Fredericktown, Missouri, on behalf of NL Industries, Inc. (NL) and Anschutz Mining Corporation (Anschutz). This study is designed to evaluate the nature and extent of lead in soil and sediments in and around Tollar Branch Creek, and in and around Saline Creek below its confluence with Tollar Branch. The results of this study will be combined with data collected at other Fredericktown properties by EPA to provide a basis for the evaluation of the source and nature of lead in the soils and the potential to include properties in EPA's planned remedial activities. This work plan is submitted in accordance with the discussions held with representatives of Region 7 EPA and MDNR. It is understood that this work plan will be attached and incorporated by reference into the AOC being negotiated for the specific purpose of investigating the areas described in this plan.

Steven Lange, Senior Geochemist for Terranext, will serve as Project Manager for site investigation activities described in this Plan. The investigations will be conducted along Tollar Branch and along Saline Creek below its confluence with Tollar Branch, Fredericktown, Madison County, Missouri. Mr. Lange will be responsible for overall coordination of site activities, ensuring implementation of this plan and providing periodic updates to the client concerning the status of the project and coordinating activities with EPA. Mr. Heath Smith will be the EPA Project Manager for this activity.

Four Terranext employees will comprise the field sampling team. The team will be responsible for assisting EPA with obtaining access to properties, acquisition and calibration of sampling equipment, sample collection, field screening, documentation of residential property conditions and field activities, and coordination of laboratory analyses.

The Terranext quality assurance (QA) manager will provide technical assistance, as needed, to ensure compliance with this Plan. In addition, the Terranext QA manager will coordinate with

EPA's project personnel to assure that all work done meets or exceeds the standards employed by EPA on their portion of this same undertaking.

Although the intent is to adhere to this Plan, the proposed activities may be altered in the field if warranted by site-specific conditions and unforeseen hindrances that prevent any aspect of this Plan from being implemented in a feasible manner. Such deviations will be made following consultation with and concurrence from EPA. Relevant data will be recorded in the site logbook as necessary. This Plan will be available to the field team at all times during sampling activities to serve as a key reference for the proposed activities.

1.3 PROBLEM DEFINITION, BACKGROUND, AND SITE DESCRIPTION

1.3.1 Problem Definition

This Plan has been prepared by Terranext to address the nature and extent of lead in soil and sediments in and around the Tollar Branch, and in and around Saline Creek below its confluence with Tollar Branch, within Fredericktown, MO, and to differentiate among the likely sources of the lead.

1.3.2 Background

The Madison County Mines Site is located in Madison County in Southeastern Missouri approximately 80 miles south of St. Louis and in close proximity to the town of Fredericktown as shown on Figure 1. The Madison County Mines Site consists of 11 tailings piles and abandoned mine workings within 6 miles of each other. The Madison County Mine site includes six main subsites, also known as Operable Units (OU).

- OU 01 includes the Basler tailings, Harmony Lake tailings, and the Mine La Motte Recreation Association Property.
- OU 02 includes the Madison Mine currently owned by the Anschutz Mining Corporation.
- OU 03 includes the Conrad tailings.
- OU 04 includes the Catherine tailings.
- OU 05 includes the Skaggs tailings.
- OU 06 includes the Little St. Frances River Tailings.

Operable Unit 02 is located in Sections 16, 20, 21, 27, and 28 and U.S. Surveys numbered 2073, 3089, and 3171, Township 33 North, Range 7 East in Madison County, Missouri and is comprised of:

- Madison Mine;
- Areas within the vicinity of the Madison Mine site affected by mine waste from the 1977 tailings dam break and flood from tailings pile D; and the
- Cooper (Refinery) Property.

The Madison Mine, as referred to in this work plan, includes the approximately 1,750 acres owned by Anschutz. As shown on Figure 2, the major areas of disturbance are in the northern portion of the site. Major site features include the A tailings, B tailings, C tailings, D tailings and E tailings disposal sites; the Metallurgical or "Met" pond; remnants of an old mill and roaster; headframe and abandoned shafts; a decline; and a possible chat pile.

1.3.3 Site History

The Madison Mine was first worked for copper in 1844, and later produced copper, cobalt, lead, zinc, iron, and silver.

In 1902, the North American Lead Company was formed and took over the Madison Mine. A large mill (capable of processing 500 tons of ore per day) was built, and produced \$80,000 of lead concentrate in 1903. The North American Lead Company began operating a smelter and refinery at the mine in 1907. Between 1902 and 1910, the North American Lead Company produced approximately \$556,100 of lead.

The Missouri Cobalt Company purchased the Madison Mine in 1916, and a new 300-ton-per-day mill and a 100-ton-per-day smelter were built on the property in 1918. From 1918 through 1920, approximately 649 tons of lead concentrate were produced.

The Missouri Cobalt mill was put back into production in 1943, after a shutdown period during the depression. The mill was retrofitted, turning it into a 600-ton-per-day flotation system. It has been estimated that between 1944 and 1961, approximately 121,169 tons of lead concentrate were produced. A total of approximately 5,000,000 tons of tailings are thought to have been disposed on site.

In March 1977, the D-tailings dam, located on what is now the Anschutz Mining Corporation property (OU 02), was breached during a rainstorm releasing tailings and pond water into Tollar Branch Creek. The release was caused by the failure of a fresh water pond located up stream from the D-tailings area. Tollar Branch enters the city of Fredericktown from the south and flows through the northwestern portion of Fredericktown after joining with Saline Creek.

Anschutz Mining Corporation, the current owner of the property, acquired the property (excepting the Cooper Property) in 1979. Surface diamond drilling outlined areas of potential Co-Ni-Cu ore. The mine was dewatered and the decline and the No. 1 shaft were rehabilitated. In 1981, underground rehabilitation began and a bulk ore sample was collected and tested. As a result of falling cobalt prices, rehabilitation activities ceased and the mine was allowed to flood. The mine was never placed back in production or operated by Anschutz.

In 1982, AMC constructed a new dam immediately down gradient of the D-tailings dam and outlet works in response to the Corps of Engineers determination that the repaired D-tailings dam was classified as unsafe. The improvements included construction of a downstream, earthen, sand wick dam for the D tailings area, a concrete spillway, and a diversion berm to divert non-contaminated, storm water run-off around the tailings area. Surface water that is diverted around the D tails is directed through a Gabbion Structure located on the southern end of the dam. The dam contains the D tails and precipitation falling directly on the tailings preventing the release of tailings materials to off site areas.

1.4 INVESTIGATIONS IN FREDERICKTOWN

A total of 1,708 residences are present in Fredericktown. Mine waste has historically been moved around within Madison County and the city of Fredericktown. The chat (pea sized waste from gravity separation activities) and mine waste were reportedly used in the yards, driveways, and on the city's streets.

In June 2002, the Madison County Health Department requested the EPA's assistance in sampling mining waste that was being used as fill at a local agricultural feed store. A child living nearby was identified as having an elevated blood-lead level, and the mining waste was suspected to be a potential source of this lead exposure. Samples collected from the mining waste confirmed that it contained high lead concentrations. Additionally, the health department provided data to EPA identifying nine other children at six other residences that had elevated blood-lead concentrations. Lead concentrations in the soils at these homes were known to be elevated (>400 milligrams per kilogram [mg/kg]). Lead concentrations in soil recorded by the health department were as high as 15,000 mg/kg.

In August 2002, EPA tasked Tetra Tech START to conduct removal assessment support activities at Fredericktown. Removal assessment activities began on August 5, 2002 and continued until August 28, 2002. These activities included acquiring access to residential properties, screening surface soils on residential properties for lead contamination using portable X-ray fluorescence (XRF) equipment, confirmation sampling, and supplemental surface water, sediment, and surface soil sampling for Hazard Ranking System (HRS) scoring purposes. Tetra Tech START also collected global positioning system (GPS) data, documented site activities in a field logbook, and took photographs. A total of 215 properties were screened for lead contamination. Ninety-two properties exhibited lead concentrations above 400 mg/kg, which is the EPA Region 9 preliminary remediation goal (PRG) for residential soils (Tetra Tech 2002). Of these 92 properties, 42 had driveways consisting of a chat-like material or other visible chat-like material on the lots. Overall, Tetra Tech START observed 240 homes in the Fredericktown area with some form of visible chat-like material; however, only 42 of these properties were screened during the removal assessment due to the random screening selection process and limited scope of the assessment.

1.5 PROJECT AND TASK DESCRIPTIONS

The activities described in this Plan address the characterization of soil from residential yards, play areas, gardens, sand piles, driveways, and other high-use areas potentially affected by the tailings released into the Tollar Branch in 1977. Relevant aspects of the project are described in the following sections of this Plan.

1.6 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

The primary QA objective for this project is to provide valid data of known and documented quality. Specific data quality objectives are discussed in terms of accuracy, precision, completeness, representativeness, and comparability.

For this project, accuracy is defined as the ratio (expressed as a percentage) of a measured value to a true or reference value. The analytical component of accuracy will be expressed as percent

recovery, based on the analysis of laboratory-prepared spike samples and performance evaluation audit samples. The accuracy of field screening measurements will be measured by a comparison of the screening data with laboratory results for split samples, as described in Section 2.5 of this Plan.

Precision for this project is defined as a measure of agreement among individual measurements of laboratory-prepared duplicate samples.

Data completeness will be expressed as the percentage of data generated that is considered valid. A completeness goal of 100 percent will be applied to this project; however, if that goal is not met, site decisions may still be made based on the remaining data. No specific critical samples have been identified for the project.

Representativeness of collected samples is facilitated by establishing and following criteria and procedures identified in this Plan. Data comparability is achieved by requiring that all data generated for the project be reported in common units. The following table lists the various types of data that may be generated and the specific reporting units.

SPECIFIC DATA REPORTING UNITS

Parameter	Unit
Metals in Soil by XRF	— mg/kg
Metals in Soil by Laboratory Analysis	mg/kg
Metals in Sediment by Laboratory Analysis	mg/kg
Metals in Surface Water by Laboratory Analysis	mg/L
Metals in Groundwater by Laboratory Analysis	mg/L
Metals in Air	µg/m ³
Sampled Air Volume at Standard Temperature and Pressure (STP)	m ³ STP
Sampling Flow Rate at STP	m ³ /min STP
Wind Speed	mph
Wind Direction (Field Report)	degrees on an azimuth compass
Temperature	°F

Barometric Pressure (not corrected to sea level)	mmHg
Time	military time (00:00 - 24:00)
Date	month/day/year

Notes:

$^{\circ}\text{F}$	Degrees Fahrenheit
$\text{m}^3 \text{ STP}$	Cubic meters at standard temperature and pressure
$\text{m}^3/\text{min STP}$	Cubic meters per minute at standard temperature and pressure
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
mm Hg	Millimeters of mercury
mph	Miles per hour
$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter
XRF	X-ray fluorescence

1.7 SPECIAL TRAINING REQUIREMENTS AND CERTIFICATION

All site personnel will be required to have completed a basic 40-hour health and safety (Hazardous Waste Operations and Emergency Response) training course and annual refreshers. Familiarization with the Innov-X Systems, Inc, Model XT-440 XRF and its operating procedures will also be necessary for the Terranext sampling team.

1.8 DOCUMENTATION AND RECORDS

Terranext personnel will maintain a field logbook to record all pertinent activities associated with the sampling events. Appropriate documentation pertaining to photographs taken by Terranext personnel will also be recorded in the field logbook. Information pertaining to all samples (such as sampling dates, times and locations) collected during this event will be recorded on sample field sheets and entered into a database maintained by Terranext. Labels will be affixed to sample containers, identifying sample numbers, dates collected, and requested analyses. Chain of custody records will be completed and maintained for all samples.

A health and safety plan prepared by Terranext prior to the field activities will address site-specific hazards. The health and safety plan will be reviewed and signed by all field personnel prior to initiating fieldwork, indicating that they understand the plan and its requirements. Copies of the plan will be available to all personnel throughout the sampling activities.

2.0 MEASUREMENT AND DATA ACQUISITION

2.1 DEFINITION OF AREAS TO BE SAMPLED

The areas to be sampled are limited to those potentially impacted by the tailings released from the D-tails down Tollar Branch Creek as shown of Figure 3. Anschutz and NL Industries will sample each residence adjoining the creeks and two [2] additional properties abutting each of those properties away from the creek. Any public areas (parks, playgrounds) or sensitive areas (schools, day care centers) located in areas potentially affected by flooding of the Tollar Branch will be screened for soil lead concentration.

2.2 SAMPLING PROCESS DESIGN

The proposed sampling scheme for this project will be judgmental (based on the best professional judgement of the sampling team), in accordance with the Removal Program Representative Sampling Guidance, Volume 1: Soil, OSWER Directive 9360.4-10, December 1995. The sampling proposed in the following paragraphs has been designed to identify the extent of soil contamination at the site.

Terranext will assist EPA in gaining access from each property owner in the defined study area prior to any soil screening. Locational data will be collected using a mapping grade GPS that collects data points at a horizontal accuracy of less than 5 meters. A map of Fredericktown will be produced, indicating screening locations and results. The map will help identify the spatial extent of lead contamination within defined study area by illustrating the maximum lead concentration at each residential property sampled.

At residential properties within the defined study area where access is granted, and where lead contamination is suspected, four quadrants will be established around the home. These quadrants will radiate a maximum of 100 feet from each side of the home or to the property boundary, whichever is shorter. In each quadrant, a nine-aliquot composite sample will be collected from the upper 1 inch of soil. Aliquots will be evenly dispersed throughout each quadrant, and will be selected based on the judgement of the sample team. The sample material will be homogenized in a dedicated aluminum pie pan, and screened for lead using an Innov-X Systems, Inc, Model XT-440 XRF. Additional multi-aliquot surface soil samples will also be collected from any play areas, gardens, sand piles, unpaved driveways, and any other areas which may pose a unique risk to children. The number of aliquots collected from these additional areas will depend on their size, but in general the aliquot density will be similar to quadrant sampling. For locations with no residences, the center point of the property will be established and flagged. From the center point, four quadrants will extend 100 feet in each compass direction, and the aforementioned sampling protocol will be followed (that is, a nine-aliquot composite sample will be collected from each quadrant).

To evaluate the accuracy of the XRF, at least 10 percent of all samples that are screened with the XRF will be submitted to an off-site laboratory (contracted by Terranext) for confirmation analysis of lead. Samples used for confirmation sampling will be collected from at least every fifth yard screened.

The results of the field screening and laboratory analysis may be used by EPA to direct excavation activities for the removal of lead-contaminated soil. According to EPA's decision document, they will be removing soil from any yard with soil lead in excess of 1200 mg/kg and or 400 mg/kg in sensitive areas. They will excavate contaminated areas up to a maximum depth of 12 inches below ground surface (bgs). Where remaining (deeper) soils exceed the removal action level after excavation has been completed to 12 inches bgs, a permanent barrier will be placed at the interface between the clean backfill and the underlying contaminated soil.

In addition, samples of the sediment in the Tollar Branch will be collected at the locations shown on Figure 4. These samples would be sent to an outside laboratory for potential chemicals of concern list metals analysis. A background sample of sediment in Tollar Branch will be collected in the Tollar Branch upgradient from the D-tailings.

2.3 SAMPLING METHODS REQUIREMENTS

Soil samples will be collected following BE&K/Terranext's Standard Operating Procedure 100.02. Soil samples will be collected with a clean, dedicated stainless steel spoon and homogenized in a clean, dedicated aluminum pie pan. Three consecutive XRF readings will be collected after homogenizing the soil and recorded on a field sheet. XRF screening methods will generally follow EPA Region 7 SOP No. 4231.707A. The locations of the aliquots (as well as laboratory confirmation sample locations, if applicable) will also be recorded on each field sheet. Confirmation samples will be transferred directly into the appropriate containers for off-site laboratory analysis.

The sediment samples will be collected following the procedures contained in the *Characterization Study Work Plan, Madison Mine Site, Operable Unit 2, Fredericktown, July 7, 2000* (OU-2 Characterization Plan). Sediment samples will be collected in the appropriate containers and shipped on ice, at or below a temperature of 4° C, to an off-site laboratory for designated metals analysis. Additional sediment sample locations will be judgmental based on the decision of the Terranext Project Manager, property owner access, and overall accessibility.

Disposal of investigation-derived wastes (IDW) and procedures for equipment/personal decontamination will be addressed in a site-specific health and safety plan prepared by BE&K/Terranext. In general, it is anticipated that most IDW will consist of disposable sampling supplies (gloves, paper towels) that will be disposed of off site as uncontaminated debris.

2.4 SAMPLE HANDLING AND CUSTODY REQUIREMENTS

Samples will be collected in accordance with procedures defined in OU-2 Characterization Plan. Chain of custody procedures will be maintained in accordance with the OU-2 Characterization Plan. Samples will be accepted by the contracted laboratory in accordance with the SOPs of that laboratory.

All soil, sediment, and water sample containers will be placed in plastic bags to control spillage in case the containers break during shipment. Soil, sediment, and water samples will be placed in coolers containing packing material and enough ice to ensure that the temperature of the samples

does not exceed 4°C. Necessary paperwork for all samples, including chain-of-custody records, will be completed by Terranext personnel and maintained with the coolers until delivery to the laboratory. If shipping of the samples is required by a commercial courier, each cooler lid will be securely taped shut, and two custody seals will be signed and dated, and placed across the lid opening. The samples will be submitted to the receiving laboratory by the Terranext sampling personnel in a time-efficient manner to ensure that the applicable holding times are not exceeded.

2.5 ANALYTICAL METHODS REQUIREMENTS

The samples will be analyzed at a pre-qualified laboratory contracted by Terranext, according to the EPA methods listed below. Detection limits that are typically reported by those methods are expected to be adequate for this activity. The requested analyses have been selected based on past sampling data and historical information collected for the site, and are:

- Soil Lead SW846 Method 6010B/6020
- Sediment PCOC Metals SW846 Method 6010B/6020

Because dedicated supplies will be used for all samples (stainless steel spoons, pie pans, etc), no rinsate blank samples will be required to assess the potential for cross-contamination. Analytical error (precision and accuracy) will be determined by the analysis of field blanks and laboratory-prepared duplicates and spike samples. These criteria, along with other laboratory quality control (QC) elements, will be performed in accordance with the off-site laboratory's QA plan.

To satisfy the QC evaluation criteria for the XRF data, Terranext will compare the screening data with laboratory confirmation results. The mean of three XRF readings taken for each confirmation sample will be compared statistically to the laboratory result for each confirmation sample to assess comparability. For a given XRF instrument, the regression coefficient (r^2) between the XRF data and laboratory confirmation results should be above 0.7 for the XRF data from that instrument to be considered quantitatively valid. The XRF instruments will also be regularly checked against known standards each day to assess analytical drift.

For every measurement, the Innov-X Systems, Inc, Model XT-440 XRF gives an uncertainty range that represents a 95 percent confidence interval based on counting statistics for that sample. In general, precision/accuracy increases with increasing sample run time (more counts). For samples with very high (greater than 1,000 mg/kg) or very low (less than 300 mg/kg) lead concentrations, the sample run time will only be long enough to obtain readings within 30 percent of the actual concentrations. For samples with lead levels between 300 and 1,000 mg/kg, the sample run times should be long enough to obtain measurements within 20 percent of the actual concentrations.

2.6 INSTRUMENT, EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

Testing, inspection, and maintenance of all sampling equipment and supplies, along with field screening instrumentation, will be performed by Terranext personnel prior to deployment for field activities. Testing, inspection, and maintenance of analytical instrumentation will be

performed in accordance with the contracted laboratory's analytical SOPs and manufacturers' recommendations.

2.7 INSTRUMENT CALIBRATION AND FREQUENCY

Calibration of the field screening and laboratory analytical instrumentation will be in accordance with the referenced SOPs and manufacturers' recommendations.

2.8 INSPECTION AND ACCEPTANCE REQUIREMENTS FOR SUPPLIES AND CONSUMABLES

All sample containers will meet EPA criteria for cleaning procedures required for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer, in accordance with pre-cleaning criteria established by EPA in Specifications and Guidelines for Obtaining Contaminant-Free Sample Containers. The certificates of cleanliness will be maintained in the project file.

2.9 DATA ACQUISITION REQUIREMENTS

Terranext has compiled previous data and information pertaining to the site (including other analytical data, reports, photographs, and maps that are referenced in this Plan) from various sources. Some of that data has not been verified; however, unverified data will not be used for decision-making purposes.

2.10 DATA MANAGEMENT

All laboratory data will be managed as specified in the contracted laboratory's QA manuals. The Terranext Project Manager will receive preliminary data on site. The final data package will be forwarded to a Terranext employee trained in data validation to complete the validation process. A copy of the results will be provided to the owner of each property sampled. All of the results will be summarized and included in the final report submitted to EPA.

3.0 ASSESSMENT AND OVERSIGHT

3.1 ASSESSMENTS AND RESPONSE ACTIONS

Assessment and response actions pertaining to analytical phases of the project are addressed in the contracted laboratory's QA manuals. Corrective action will be taken at the discretion of the Terranext Project Manager whenever there appears to be problems that could adversely affect data quality or decisions affecting future response actions pertaining to the site.

3.2 REPORTS TO MANAGEMENT

A formal report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by Terranext following completion of the field activities described in this plan and validation of the laboratory data. The laboratory data for soil, sediment, and water samples will be compared to all applicable or relevant and appropriate requirements, including removal action levels that have been established for the site, to determine whether further response is warranted.

4.0 DATA VALIDATION AND USABILITY

4.1 DATA REVIEW, VALIDATION, AND VERIFICATION REQUIREMENTS

A qualified laboratory analyst and the laboratory's section manager will perform data review and verification in accordance with the contracted laboratory's QA program. A Terranext employee, trained in data validation techniques, will perform follow-up validation of the data. The Terranext Project Manager will be responsible for overall validation and final approval of the data, in accordance with the projected use of the results.

4.2 VALIDATION AND VERIFICATION METHODS

A qualified Terranext employee will review the data for laboratory spikes, duplicates, and laboratory blanks to ensure that they are acceptable. The Terranext Project Manager will inspect the data to provide a final review. The Terranext Project Manager will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.

4.3 RECONCILIATION WITH USER REQUIREMENTS

If data quality indicators do not meet the project's requirements as outlined in this Plan, the data may be discarded, and re-sampling or re-analysis may be required.

5.0 REFERENCES

- Dames & Moore, 1990, "Madison Mine Preliminary Site Characterization Report, Fredericktown, Missouri"
- BE&K/Terranext LLC, July 2000, "Characterization Study Work Plan, Madison Mine Site, Operable Unit 2, Fredericktown, Missouri"
- Tetra Tech EM Inc. (Tetra Tech). January 2002. "Removal Assessment Summary Report, Madison Mine Site, Fredericktown, Missouri."

FIGURES

SITE LOCATION



FIGURE 1

MADISON COUNTY MINES OU-2
CURRENT SITE FEATURES

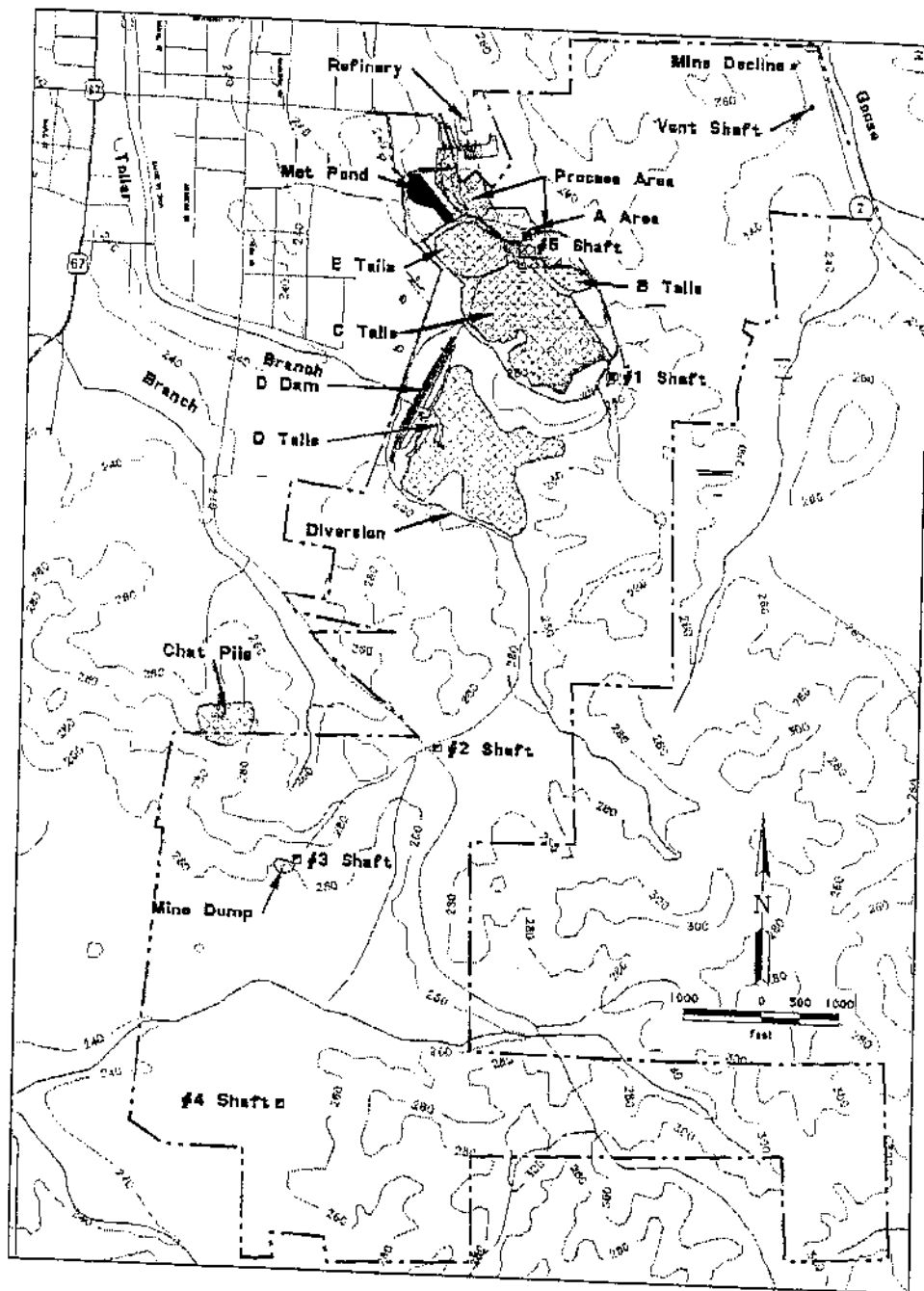


FIGURE 2

MADISON COUNTY MINES OU-2

Approximate Maximum Size of Sample Area

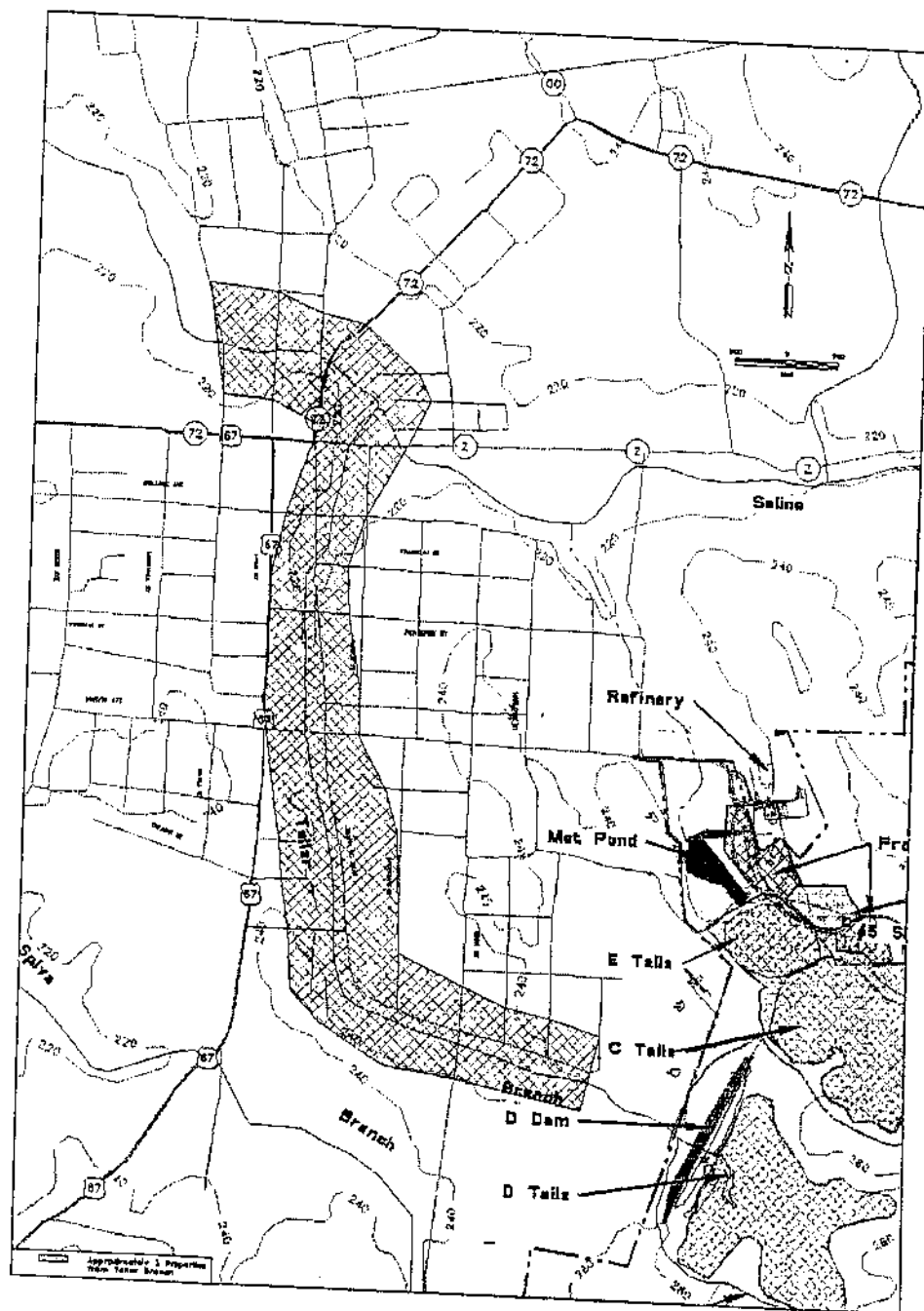


FIGURE 3

MADISON COUNTY MINES OU-2

Proposed Sediment Sample Locations

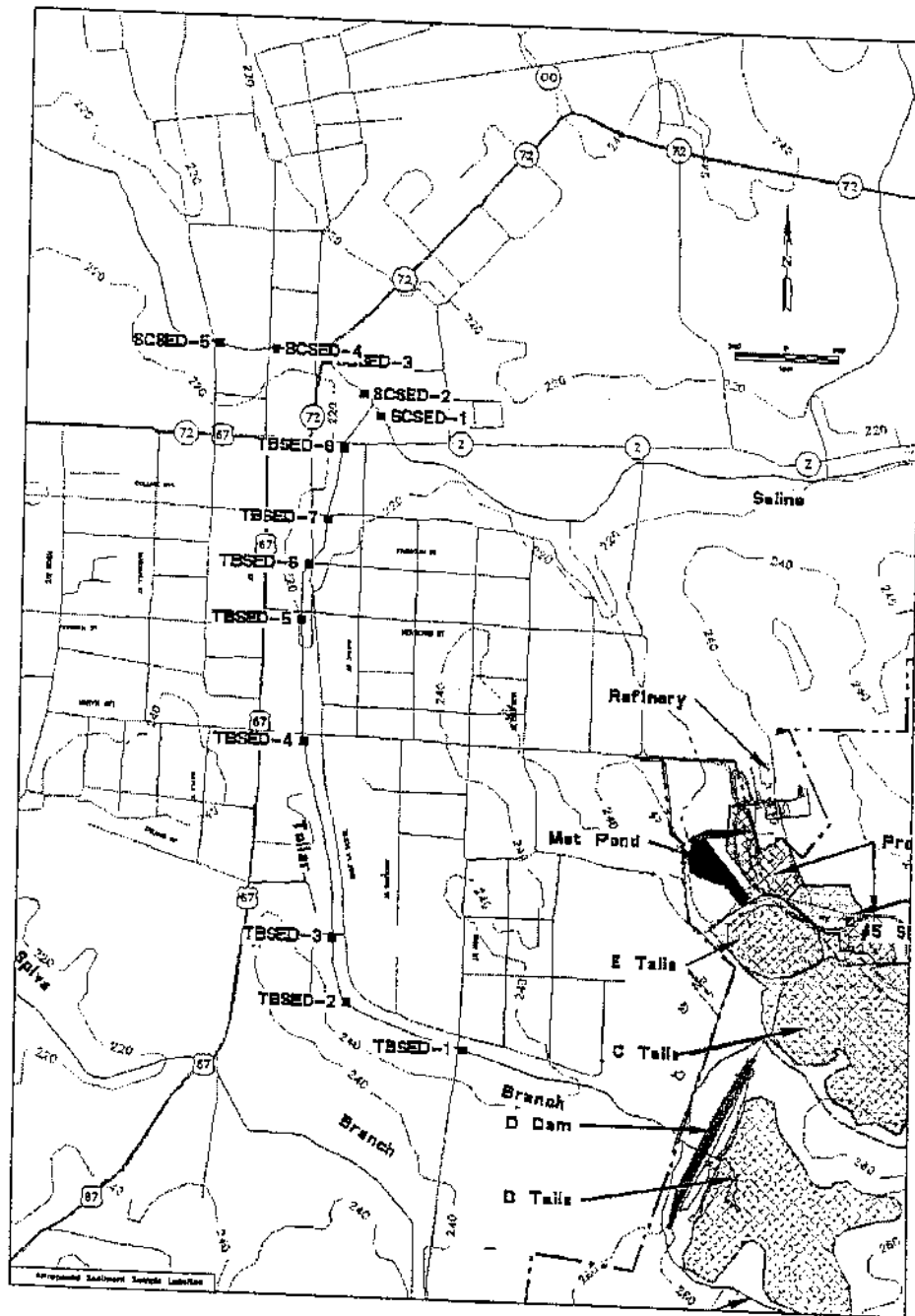


FIGURE 4